Intelligent Database Marketing and Churn Management Based on Customer Satisfaction Indices: Application to the Mobile Telecommunication Industry

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Abstract

In this paper, we suggest intelligent database marketing and churn management to maintain loyal customers and recruit new customers based on customer satisfaction indices. More specifically, we will concentrate on selecting target groups that may be different in perspective of CMRA (Churn, Maturity, Retention, Attrition), identifying customers of the target group – such as how many customers are correspond to the general characteristics of terminative customers in some period, how much they are equivalent to GD(General Descriptor) of terminative customers, and extracting features which are needed to manage by finding differences between the terminative customers and alive customers in the period.

1. Introduction

1.1 Motivation of the study

It is now well accepted that the ability to understand and therefore influence changes in customer behavior is vital for business growth and success in the competitive consumer marketplace. The "behavioral change" of value to the business may be as simple as a customer buying a new product, or it could be complex, such as encouraging certain patterns of service usage to enhance profitability or creating customer loyalty by building long-term relationships with the brand.

Since the 1990s, the telecommunications sector has become a dynamic key area for the economic development of industrialized nations [1]. This is the result of enormous technical progress as well as of the increased number of network operators and the intense competition that has developed. These factors, in turn, are a consequence of the removal of monopoly rights, which were mainly enjoyed by state-owned operators of public telecommunication networks.

In the telecommunications businesses of today there is ever growing pressure to increase the value, size and quality of the customer base. For business with hundreds of thousands or millions of customers, there is a particular challenge to respond to and influence the behavior of customers while improving the efficiency of customer facing processes. To influence customer behavior effectively, organizations need to understand what behavior patterns currently exist and how these patterns can change when actions are taken to adapt content and context of customer contact.

But, many leading organizations still do not know who their customers actually are and thus cannot picture their geodemographic and financial profile, let alone grasp the intricacies of their behavior patterns, or assess their profitability or loyalty [2].

Specifically in the field of marketing strategies for telecommunications services it is frequently pointed out that once customers have been acquired and connected to the telecommunications network of a particular operator, their long-term links with the focal operator are of greater importance to the success of the company in competitive markets than they are in other industry sectors [1][3]. Nevertheless, there is a dearth of empirical research into the extent of CR (Customer Retention) or the supply side retention drivers in particular telecommunications markets. Though there were a few empirical researches about that, they mainly concentrated on specific service parts – such as network management, quality of communication, environment of communication, SLA (Service Level Agreement), and etc. Also, they focused on testing of hypothesis that these service parts affect customer behaviors through questionnaire and set up a static model or formula to improve customer retention or the supply side retention drivers in particular telecommunications markets [1][3][4][5][6]. But the modern

telecommunications customer is a moving target, dynamic in so many aspects of working and living. In this point of view, we will suggest a model which concentrates on all service parts that are relevant the four subjects are categorized facility, server, customer, and product in perspective of TQM (Total Quality Management) and focus on dynamic aspects of customer behavior.

Many companies are now collecting large volumes of detailed data on customer behavior, and wish to use this data to improve their business's operations and marketing activities. Also periodically they conduct surveys to see whether their customers satisfy product or service providing the company or not. CS (Customer Satisfaction) is notoriously hard to measure and interpret [7]. In general, CS (Customer Satisfaction) is represented by CSI (Customer Satisfaction Index) [8]. But existing strategies for CS using the database or the CSI have following problems [2][9][10][11][12]:

- In general, many organizations establish strategy for customer marketing for the purpose of keeping their customers' CR (Customer Retention) and raising CS. At the end, they wish to gain a better position against competitors and obtain lots of managerial profit. But they are mainly used these strategies for appraisal of the executives of the organization

- Many organizations focus on relative estimation in comparison to their competitors. In this case, the competitors may not have the best position for the targeted field which the organization is interested in. Though the organization have a relative better position than other competitors do, the organization need to compare the virtual product or service that consist of all what the customers really want to.

- Many organizations select target customers that are important to target product or service and investigate their CSI results. But they have not a definite methodology how to identify and select the target customers and they select customers and survey their CSI results as many as possible. So, departments that engage in these works are sometimes regarded as cost center.

- Many organizations do not use fit questionnaire that have all contents of every subject and stage in cubic management. The existing questionnaires are inclined to focus on specific subject or stage.

- Many organizations have their own CRM (Customer Relationship Management) solutions. But when they are applied to real business, they always do not give guidance to operators.

So, we suggest a specific framework that focuses on solving above problems that the existing strategies for CR and CS using the database and the CSI have. Therefore this study concentrates on development of both dynamic and longitudinal frameworks for application of the mobile telecommunications market.

1.2 Summary of contribution

The main contributions of this study, in order of presentation, are:

- **Micro-scope focus**: The existing researches mainly concentrated on specific service parts and focused on testing of hypothesis that these service parts affect customer behaviors through questionnaire. A new framework that suggest this study concentrates on all service parts that are relevant the four objects are categorized facility, server, customer, and product in perspective of TQM and shows degree of percentage how each service part affects the customer behaviors.

- **Dynamic analysis**: This study focuses on the following dynamic aspects. First, we consider time dependent variables such as difference between previous CSI data and recent CSI data. Second, we differentiate new customers from existing customers because new customers have lots of different perceptions in comparison to the existing customers. Third, we rearrange customer groups in order to find patterns of customer behaviors precisely.

- **Guidance for real business**: Like other service industry, the mobile telecommunication industry has its general CRM solutions. But when they are applied to real business, they always do not give guidance to operators. The suggested framework enables operators to response effective and flexible in any situations.

2. Review of current research activities
2.1 Profile of the Korean mobile telecommunication market

For the past several years, the scale of mobile telecommunication market in Korea has increased enormously. And the internal structure of the mobile telecommunication market changes rapidly as the technology advances. The trend is characterized by the preferences to quality of services including quality of communication, variety of value added services and link with PCs. With this trend, the mobile telecommunication industry is considered as a high value added industry.

The mobile telecommunication industry belongs to the process industry that is applicable to experience curve [13]. The profitability of process industry including the mobile telecommunication industry absolutely depends on their subscribers [14][15]. In the point of view, marketing strategies of the Korean mobile telecommunication

operators focused on recruiting new subscribers. But the trend of rapid environmental changes and bloody competition among the mobile telecommunication operators cause the existing subscribers to switch service provider with increasing rate. Also, as the market is close in time to mature, the mobile telecommunication operators are in trouble to recruit new customers and try to attract competitors' customers [15]. So, the mobile telecommunication operators must preserve their own customers' loyalty and manage their own customers effective methods – such as marketing, membership and etc.

The existing researches concentrate on specific service parts and focus on testing of hypothesis that these service parts affect customer behaviors through questionnaire and set up a static model or formula to improve customer retention or the supply side retention drivers in particular telecommunications markets [1][2][3][4][5][6][9][15]. These are categorized into four subjects according to the four perspective of TQM in table 1.

Table 1   Categorization of the existing researches in perspective of TQM

	Main issue	Methodology
Facility	Network Management [9]	New system deployment or update
Product	There is need to research	There is need to research
Customer	Profitability [5][6] Marketing [2] Customer churn & retention policy [1][3][4][15]	M&A, Business strategy General CRM methodology Methodology based on static model or formula
Server	There is need to research	There is need to research

2.2 CRM for service industry including the mobile telecommunication industry

Service companies including the mobile telecommunication companies of the future will be successful because deliver in the following areas [2]:

- Integration of marketing, risk, customer profitability, customer service, management and loyalty into a single CRM division.
- Use of detailed transactional data to fully understand the behavior of their customers.
- Formulation of new approaches to the market based on performing test campaigns, building knowledge, and then having operational support to rollout refined campaigns in a matter of days to stay ahead of the competition.
- Creation of CRM processes to enable interaction with customers that is not only efficient and effective but also grows real customer loyalty.
- Differentiate between customers based on their true value to the organization.

Many firms know about their customers, but few know the customers themselves or how to get new ones [16]. Successful firms begin all customer-knowledge management initiatives by prioritizing business strategies and customer-relationship objectives. They know which customers are worth the organization's resource and which customers to focus on and what new behaviors the customers should exhibit. The operational features of the successful firms have are summarized as following:

- **Aim for the optimal knowledge mix**. There's no single solution to knowledge management. Use a variety of approaches.
- **Don't use one repository for all data.** The fully integrated customer-knowledge environment seems more an intriguing idea than a practical reality. Diverse forms of information are difficult to combine in one set of database records, and firms risk having a departing employee walk away with highly developed knowledge. Consequently, customer data is fragmented across multiple systems and locations. No one has been able to combine hard (transaction-based) and soft knowledge in one customer database.
- **Think creatively about human knowledge.** This is the main practice that separates the leaders from the laggards. It was seen many creative solutions to managing both explicit (documented and accessible) and tacit (understood but undocumented and not accessible) knowledge.
- **Look at the broader context.** Customer-knowledge initiatives do not exist in a vacuum. Their success depends on the organization's roles and responsibilities, the workplace culture, and the organizational structure.
- **Establish a process and tools.** Many firms seem to stop working when they've selected a management strategy — avoiding the planning that is critical to implementation. The leading firms work hard to

deliberately manage customer knowledge, using a defined process and creating tools as needed.

These features are correspondent to those of CRM. CRM enables us to use characteristics of customers and to deploy 1:1 marketing by analyzing data collected on customer contact point such as sales office, call center and so forth [17]. The Knowledge Capital Group suggests the market map, which is shown in figure 1, as an enabler of CRM which provide a high-level perspective on the CRM marketplace. In this section, we will discuss all of the categories on the market map [18].

(1) Customer Information

Customer information is at the core of all successful CRM effort. Thus, information repositories and data stores are the fundamental infrastructure on which all efforts to understand, manage and interact with customers are based. In this category, there are two sub-categories: Front office unification and data warehousing and integration.

● **Front Office Unification**

The object of front office unification is "all-information-on-the-finger" concept. That is, sales, marketing and service data is fully connected and provide a single, unified view of the customer.
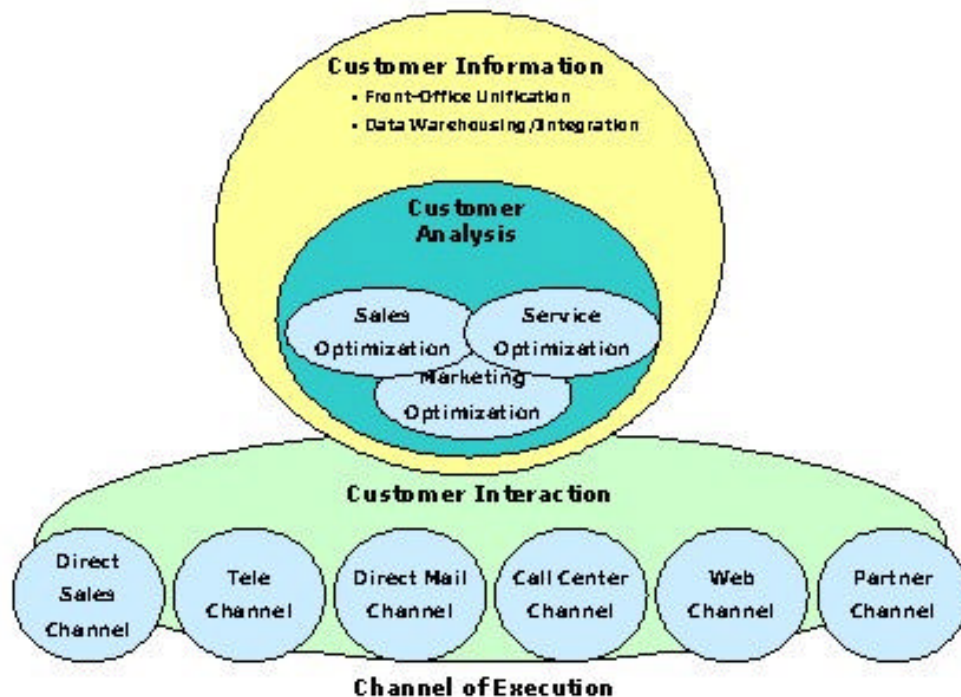
Source: The Knowledge Capital Group

Fig. 1 The Market map which is suggested by the Knowledge Capital Group

This concept is a very important to the B2B environment which wide array of industries is connected to each other. Also, they provide the underlying information foundation for all customer management efforts.

● **Data Warehousing and Integration**

While front office unification tends to be more B2B in orientation, this category tends to be more B2C. It revolves around large transaction volumes and vast information storehouses and tends to encompass hardware, software and, to some extent, services. Data warehouses are centralized repositories that consolidate data from multiple operational and external sources to provide a uniform view of customers and the business. Companies need to have well defined applications if these warehouses are to be valuable. A data mart is a subset of the larger data resource, typically oriented toward a specific purpose or data subject. Data marts have the advantage of being operational and business-focused.

● **Customer Analysis**

Practically, the purpose of customer analysis tools is customer segmentation. Numerous companies provides tools

that enable customer analysis professionals to more effectively analyze, model and mine their customer data. Customer analysis will be an increasingly essential element of CRM in the future, as companies begin to realize that customer knowledge precedes and precipitates all other CRM actions.

Customer analyses essentially take two forms: prospective and retrospective analysis. One provides data analysis technologies that enable companies to predict or estimate the future actions or values of customers, while the other provides a multidimensional conceptual view of current activities, which can be sliced and diced and examined quickly

■ *Sales Optimization*

Concept of the sales optimization is the ability to embed and enable best practices related to sales. While, there is a strong overlap between this and the front office unification. In case of a insurance company, sales person play an important role in this category.

■ *Marketing Optimization*

Marketing is a pervasive activity, which overlaps heavily with both customer analysis and customer interaction. Campaign management software automates and integrates the planning, execution measurement and refinement of marketing campaigns.

■ *Service Optimization*

Today, every company realizes that continual providing of new services is the critical success factor of the Internet era. Because, it is easier than ever for customers who do not receive good service to switch to a competitor. All it takes is a click of the mouse. If companies are to effectively address customer problems and their hot issue, then they could solve customer problem and raise their loyalty. To do so, companies should provide service and support professional more productive and more effective to customers. They must address customer service issues efficiently, but they must also ensure the customer walks away pleased by the outcome of the interaction.

● **Customer Interaction**

One important trend in the field of CRM is that front office activities should be deeply integrated with activities that take place in the channel. Channel is a place that information is exchanged, offers are made and relationship between company and customer are built. The new challenge that company now face is managing these customer relationships across channels more effectively. Company should be able to track their customers across these various channel and remember their interaction for acquiring customer information or knowledge. Customer interaction moves closer to real-time. For example, almost call center works everyday in a year. A call center is a traditional customer interaction platform and then a web represents an extremely powerful vehicle, enabling a company to craft a marketing message that addresses the customer personality – all in a rapid, automated fashion. As customer relationships become more interactive and personalized, companies will manage interactions with an increasingly sophisticated set of business rules, algorithms and parameters.

● **Channel of Execution**

To connect customer and company, there are multiple points of interaction and commerce. They are channel of execution. When we speak of interaction management, it is the individual channels that are being managed.

■ *Direct Sales Channel*

This channel is unique in that we are recognizing an individual (or group) as the actual channel. Indeed, company strengthens the channel by making the sales force more effective. They enable the direct sales person to perform much more productivity and address the needs and concerns of customers more effectively.

■ *Tele Channel (including Call Center Channel)*

For many companies, this is the most powerful channel of interaction and commerce. Companies have built their own call center rely on a complex tangle of switches, PBXs, interactive voice response (IVR) systems, scripting system, and pop-up screens. At the same time, there are outsourced contact centers that take on the management of these capabilities for companies.

■ *E-mail channel*

The e-mail channel has a great potential and a tremendous return on investment is e-mail. It can be personal; it certainly is interactive. It represents a strong way for companies and customers to engage in an interaction. This is a powerful, personal and economical form of customer interaction.

■ *Web-Channel*

Today, customer interaction is largely driven by the Internet. It is has made it possible to make interaction both personal and cost-effective. Companies are now wrapped up in the opportunity to gather information

about their customers and use that information to provide a personalized offer. To collect customer data, web mining is applied to the web-log or cookie information. Content management, collaborative filtering and dynamic personalization have all become part of the Web site infrastructure.

■ *Partner Channel*

Customer-focused companies should consider the needs of indirect channel partners: distributors, resellers, and retailers. Powerful customer interaction depends on power partner relationships. This is a relatively small but high growth segment of the CRM marketplace.

3. Methodology

3.1 The need for speed and flexibility

The SK Telecom (new brand name of Korean Mobile Telecommunications) has started mobile service since 1988 year in Korean. Until appearance Shinsegi Telecom (merged into SK Telecom) in 1994 and three PCS operators which are KTF, HSP (merged into KTF), LGT in 1997, the SK Telecom has had a right of monopoly in the field of mobile telecommunication network and service. Through bloody competition to recruit new subscribers and to attract competitors' customers between the four mobile service operators, the SK Telecom's market share in the field of mobile telecommunication service had fallen 41.3% at the end of March in 1999 [15]. It was needed to establish an active strategy program in order to defense the SK Telecom's market share.

The SK Telecom's TTL, a new mobile telephone service is one of the strategy programs and has been launched to accommodate the lifestyle and preferences of the younger generator from July in 1999. Its marketing strategies have focused on giving special benefits to the target customer group so called N-generation and making their own community. Its marketing strategies are listed table 2 [19].

Table 2 The contents of TTL service

New price plan	• Local discount plan • Couple price plan • Registered phone number plan • School discount plan
New mobile phone	• Exclusive terminals • Variety of colors and design
New distribution channel	• TTL zone
New value-added service	• Wireless integrated internet multimedia service n.TOP
New communication	• Brand image (011-TTL)
New membership	• TTL card giving discount services in fast-food restaurants, movie theaters and PC cafes.

This new service has proved very popular since it is based on an approach that recognizer generational cultural difference and has recruited so many N-generation subscribers. These customers will have served important role for future telecommunication market and utilized to customer base for next generation services. Table 3 and figure 2 show the specific results of TTL service [15].

Table 3 The results of TTL service

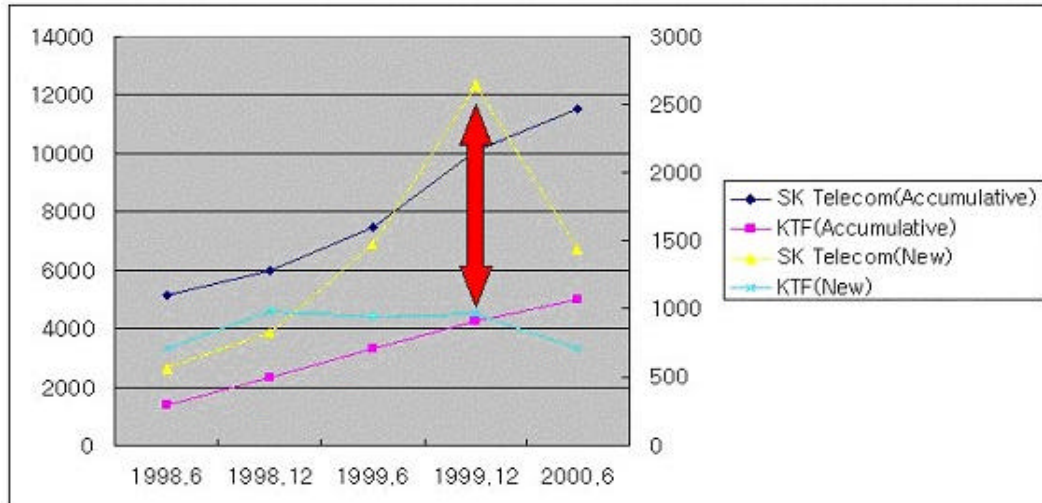| SK Telecom's market share	Before launching TTL service (1999.6)	After launching TTL service (1999.12)
Market share of new subscribers	26%	50%
Market share of accumulative subscribers	41%	43%

Figure 2 Flow chart for accumulative and new customers for SK Telecom and KTF

The successful results of TTL service cause competitors to establish their marketing strategies like TTL. The marketing issues of the mobile telecommunication companies have been changing from quality of service to making cultural community.

Like the case of TTL service, a mobile telecommunication company can take advantages of high financial and market value if it can provide new, various and good services to customers more quickly and timely manner than other competitors do. However, the modern telecommunications customer is a moving target, dynamic in so many aspects of working and living. A sophisticated approach is therefore needed to be able to track and understand true customer behavior. The explosion of call center systems, customer databases, loyalty card schemes, digital telephone exchanges and the computerization of almost all business processes now makes it possible to collect vast amounts of detailed data on customers and what they do. Technology advancement has provided the ability to collect and store a mountain of raw data generated in the course of running a customer-centric business.

This type of analysis is not only if interest to cellular network operators/service providers but also to other industries for following reason [1]. To date management research on CR and CS has been concerned almost exclusively with over-the-counter goods sold in unconnected individual transactions in mature markets. In the mobile telecommunication market, however, usage-dependent and service-live contract goods are sold. By focusing the analysis on this type of market a less made-to-order field of research is investigated.

The mobile telecommunication company which wishes to deliver the ideal solution requires a system that can make best use of the detailed data available, but can also support all the associated business processes required to deliver actions.

3.2. A new framework for CMRA strategy

We suggest CMRA strategies which enable micro-scope and dynamic analysis. The CMRA is named for the first letters of Churn, Maturity, Retention and Attrition. The framework of CMRA strategies is shown in figure 3.
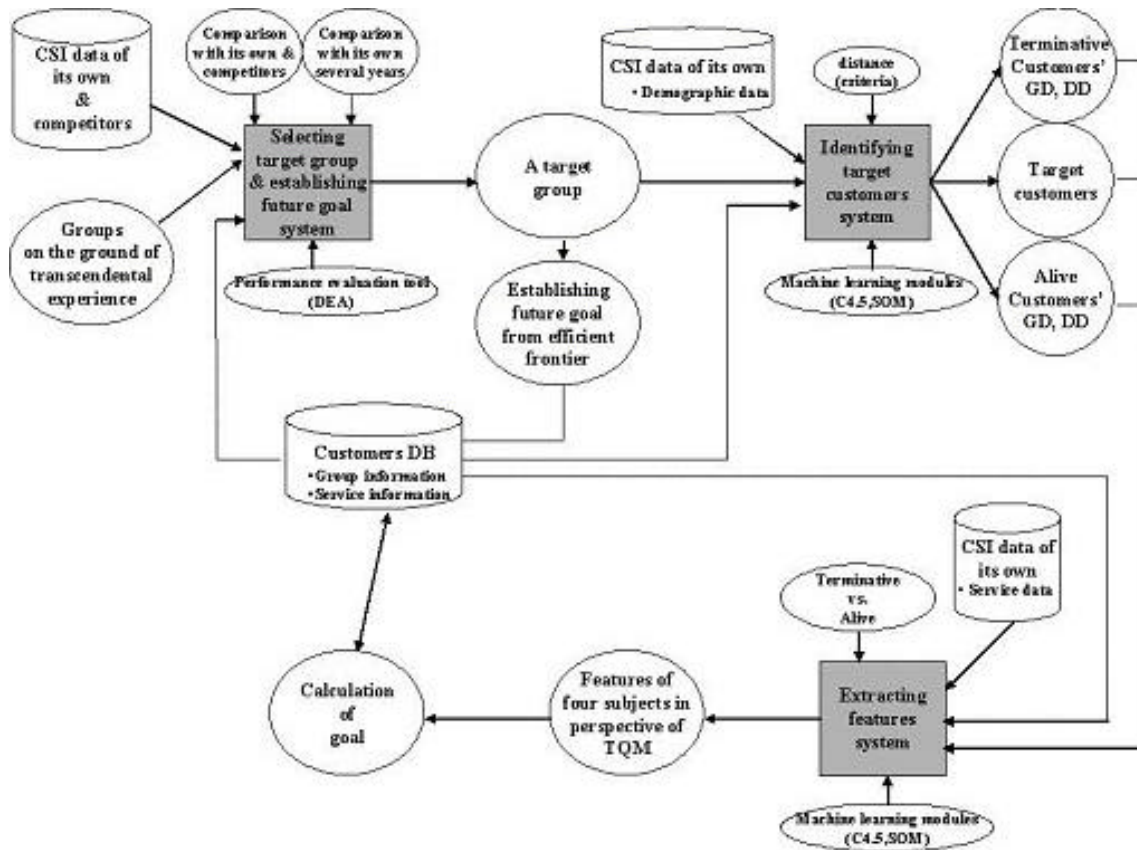
Figure 3   Block diagram of CMRA strategies

The CMRA strategies concentrate on selecting target groups that may be different in perspective of CMRA (Selecting target group system), identifying customers of the target group (Identifying target customers system)–such as how many customers are correspond to the general characteristics, which is called GD (General Descriptor in this study), of terminative customers in some period, how much they are equivalent to GD of terminative customers, and extracting features which are needed to manage by finding differences between the terminative customers and alive customers in the period (Extracting features system). In this point of view, many customers may belong to different group in perspective of CMRA from service subscription to service termination by their dynamic aspects of working and living. So, CMRA strategies allow managers to look at their customer management from the four important perspectives just like BSC (Balanced Score Card) does [20].

The CMRA strategies do micro-scope and dynamic analysis by following methods:

- **<u>Dynamic aspect</u>** - We select the target group or target customers and rearrange them in consideration of contractual period because customers have different behavioral pattern according to contractual period [1]. Also, we survey IQS (Initial Quality Study) and SS (Satisfaction Study) in consideration of contractual period like the J.D.Power which is famous for marketing in field of automotive business does [21].

- **<u>Micro-scope</u>** - We extract the features which are needed to manage in each perspective of TQM. Also, we predict degree of affection of any features which are needed to manage by setting managerial variables of them in advance.

- **<u>Dynamic aspect</u>** - We add some time-dependent variables to CMRA analysis – such as difference between expectation value and real value.
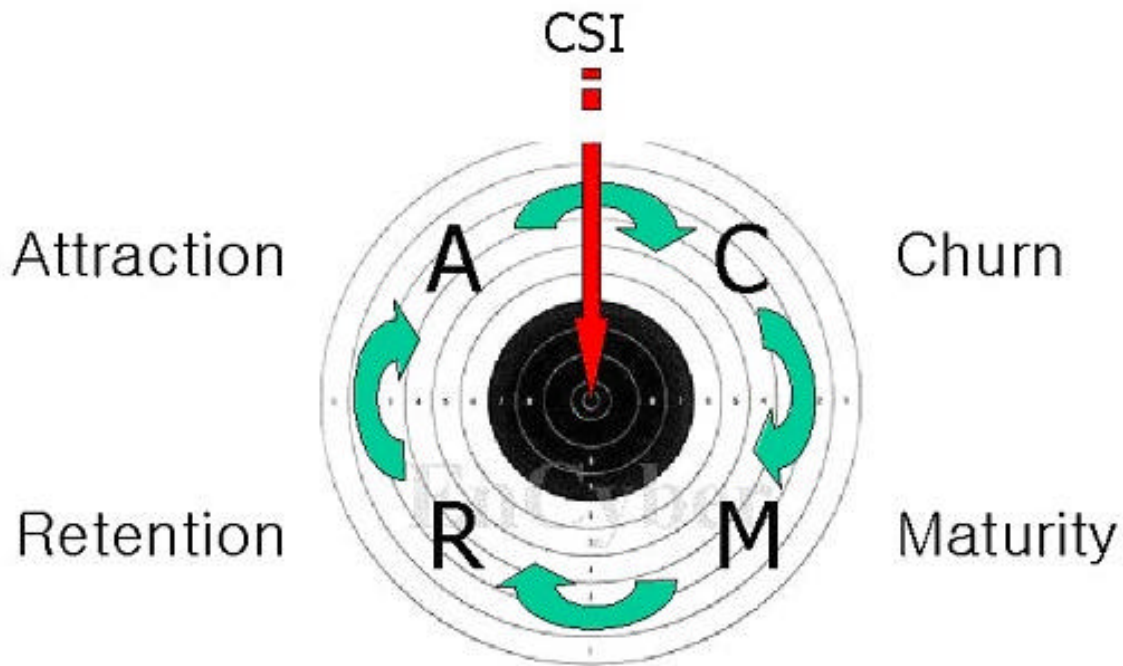
Figure 4　Relationship of CMRA

4.　**Conclusion and further research**

4.1 Conclusion

It is now a necessary core competence for organizations to build an understanding of how customers behave and to continue to enhance this by learning how different service levels, communication methods and channels affect different customers. This approach builds a depth of market and customer knowledge that will provide a springboard to corporate survival and market dominance.

But the existing researches mainly concentrated on specific service parts focusing on testing of hypothesis that these service parts affect customer behaviors through questionnaire and set up a static model or formula to improve customer retention or the supply side retention drivers in particular telecommunications markets. Also, when they are applied to real business, they always do not give guidance to operators.

The main contributions of this study are:

• **Micro-scope focus**: The existing researches mainly concentrated on specific service parts and focused on testing of hypothesis that these service parts affect customer behaviors through questionnaire. We suggest this study concentrates on all service parts that are relevant the four objects are categorized facility, server, customer, and product in perspective of TQM and shows degree of percentage how each service part affects the customer behaviors.

• **Dynamic analysis**: We focus on the following dynamic aspects. First, we consider time dependent variables such as difference between previous CSI data and recent CSI data. Second, we differentiate new customers from existing customers because new customers have lots of different perceptions in comparison to the existing customers. Third, we rearrange customer groups in order to find patterns of customer behaviors precisely.

• **Guidance for real business**: Like other service industry, the mobile telecommunication industry has its general CRM solutions. But when they are applied to real business, they always do not give guidance to operators. The suggested framework enables operators to response effective and flexible in any situations.

4.2 Further research

With the proposed framework, we will perform the CMRA analysis in a mobile telecommunication company. First, we will conduct IQS and SS survey in consideration of contractual period. Second, we will unfold CMRA analyses based on above survey results. These analyses will focus on selecting target group, identifying target customers and extracting features to be managed in the four perspectives of TQM. Last, we will guide operational activities of the mobile telecommunication in order to take advantages of high financial and market value if it can provide new, various and good services to customers more quickly and timely manner than other competitors do.

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